Curriculum Vitae

Professor Dr. Lars Röntzsch

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h-index: 25 [as of 2025-04-01]
Research Interest Score: 1159 [as of 2025-04-01]

Employment History

From 07/2022	Full Professor (W3), Chair of Thermal Energy Technology and Head of Hydrogen Research Center at Brandenburg University of Technology BTU in Cottbus, Germany
From 01/2025	Vice Dean International Affairs of Faculty 3 Mechanical Engineering, Electrical and Energy Systems at BTU
01/2013 – 06/2022	Head of Department »Hydrogen Technology« at Fraunhofer IFAM
09/2007 – 12/2012	Group Manager at Fraunhofer IFAM
05/2007 – 08/2007	Research Staff at Dresden University of Technology, Institute of Materials Science
11/2003 – 04/2007	Research Staff at Research Center Dresden-Rossendorf, Institute for Ion Beam Physics and Materials Research

Education

12/2007	Graduation: *Doctor rerum naturalium* (grade: summa cum laude)
09/2003	Graduation: *Diplom-Physiker* (grade: very good)
09/2000 – 05/2001	Studies of Physics, Philosophy & International Relations at Boston University, MA, USA
10/1997 – 09/2003	Studies of Physics at Dresden University of Technology
06/1996	*Abitur* (grade: 1.0)
09/1984 – 06/1996	School attendance

Awards

IQ Innovationspreis Mitteldeutschland (category *Energy · Environment · Solar*), Naumburg, Germany, 2015.
f-cell Award (category *Science*), Stuttgart, Germany, 2013.

E.ON International Research Initiative Award, 2010.

Fraunhofer Attract Grant, 2007.

E-MRS Young Scientist Award, Strasbourg, France, 2004.

IBMM 2004 Poster Award, Monterey, USA, 2004.

Scholarship of the *Kulturstiftung Dresden der Dresdner Bank*, 2000 – 2001.

Teaching

Responsibility for the following modules and lectures for various Bachelor's and Master's programs at BTU:

Title	*No.*	*Description*
Renewable Energy Technologies for Power Supply	12165	Description
Energiewandlung (in German)	12294	Description
Gasversorgung (in German)	12985	Description
Hydrogen and Fuel Cells	13926	Description
Data Analytics and Process Modelling	14414	Description
Research Seminar and Ring Laboratory for Energy Technology	35317	Description
Kraftwerkstechnik 1 (in German)	35320	Description
Planung, Bau und Instandhaltung von Energieversorgungsanlagen (in German)	35321	Description
Technik und Nutzung regenerativer Energiequellen (in German)	35322	Description
Power Plant Technology 1	35449	Description
Power Plant Technology 2	35450	Description

Skills and Expertise

Computer	C/C++, Ebsilon Professional, ASPEN, Kinetic Monte Carlo, Basic, Latex, PovRay, RasMol, TRIM, TRIDYN, FlexPDE, COMSOL Multiphysics, Maple, Adobe CS, Corel Draw, Origin, MS Office
Experimental	energy technology, hydrogen and fuel cells, thermochemical heat storage, renewable fuels, e-fuels, materials science, electrochemistry, thin film deposition, thermoanalysis, metallurgy, metal powder technology, sintering, ion beam technology, electron microscopy, diffraction and scattering, X-ray and neutron imaging
Languages	German (native speaker), English (fluent), Spanish (basic), Russian (school level), Latin (school level), Ancient Greek (school level)
Hobbies	tennis, ancient Egypt, architecture, glazing techniques, fruit breeding

List of Publications

[79] S. Jana, L. Röntzsch, *Numerical modelling and performance projection of a dual-stage metal hydride operated hydrogen compressor*, submitted (2025).

[78] N. P. Sakkas, F. Gillung, K. Thummar, R. Abang, L. Röntzsch, *Advanced pressurized alkaline water electrolysis at high temperatures up to 130 °C*, submitted (2025).

[77] K. Danila, P. Kunz, L. Röntzsch, *Dynamic operation of low-temperature electrolyzer systems in modular large-scale chemical plants*, Chemie Ingenieur Technik, in print (2025).
DOI: 10.1002/cite.202400140

[76] S. Jana, P. Muthukumar, L. Röntzsch, *Transient analysis and performance prediction of metal hydride based thermal energy storage system with integrated cooling and heat recuperation*, submitted (2024).

[75] A. Reimann, P. Kohlenbach, L. Röntzsch, C. Schneider, *Development and validation of a quasi-2D electrolysis stack model with a focus on dynamic thermal behavior*, International Journal of Hydrogen Energy, vol. 118, pp. 457–471 (2025).
DOI: 10.1016/j.ijhydene.2025.03.225

[74] P. Sharma, L. Röntzsch, V. K. Shahia, *Advancements towards optimization of metal–organic framework-based polymer electrolyte membranes for aqueous redox flow batteries*, Journal of Materials Chemistry A (2025).
DOI: 10.1039/D4TA08720H

[73] S. K. Sampangi, L. Röntzsch, *Electrolysis – Proton exchange membrane water electrolysis: State-of-the-art technique and systems*, in J. Reedijk (Ed.) *Reference Module in Chemistry, Molecular Sciences and Chemical Engineering*, ISBN 978-0-12-409547-2, Elsevier, 2024.
DOI: 10.1016/B978-0-323-96022-9.00237-1

[72] A. Reimann, P. Kohlenbach, L. Röntzsch, *Development of a novel quasi-2D PEM Electrolyzer Model in Modelica*, Proceedings of the 15th International Modelica Conference, Aachen, 9-11 October 2023, Linköping University Electronic Press, 2023.
DOI: 10.3384/ecp20463

[71] S. Metz, T. Smolinka, C. I. Bernäcker, S. Loos, T. Rauscher, L. Röntzsch, M. Arnold, M. Jahn, M. Kusnezoff, G. Kolb, U.-P. Apfel, C. Doetsch, *Producing hydrogen through electrolysis and other processes*, in R. Neugebauer (Ed.): *Hydrogen Technologies*, Berlin, Springer Vieweg, 2023, ISBN 9783031162961.
DOI: 10.1007/978-3-031-22100-2_9

[70] Ö. Akay, A. Bashkatov, E. Coy, K. Eckert, K. E. Einarsrud, A. Friedrich, B. Kimmel, S. Loos, G. Mutschke, L. Röntzsch, M. D. Symes, X. Yang, K. Brinkert, *Electrolysis in Reduced Gravitational Environments: Current Research Perspectives and Future Applications*, npj Microgravity, vol. 8, article no. 56 (2022).
DOI: 10.1038/s41526-022-00239-y

[69] N. Kardjilov, A. Hilger, H. Markötter, A. Griesche, R. Woracek, F. Heubner, L. Röntzsch, M. Grosse, I. Manke, J. Banhart, *Quantification of hydrogen in metals applying neutron imaging techniques*, Microscopy and Microanalysis, vol. 28 (Suppl. 1), pp. 1666 (2022).
DOI: 10.1017/S1431927622006638

[68] C. I. Bernäcker, T. Gimpel, A. Bomm, T. Rauscher, S. Mauermann, M. Li, E. G. Hübner, W. Schade, L. Röntzsch, *Short pulse laser structuring as a scalable process to produce electrodes for large alkaline water electrolyzers*, Journal of Power Sources, vol. 538, pp. 231572 (2022).
DOI: 10.1016/j.jpowsour.2022.231572

[67] S. Metz, T. Smolinka, C. I. Bernäcker, S. Loos, T. Rauscher, L. Röntzsch, M. Arnold, M. Jahn, M. Kusnezoff, G. Kolb, U.-P. Apfel, C. Doetsch, *Wasserstofferzeugung durch Elektrolyse und weitere Verfahren*, in R. Neugebauer (Ed.): *Wasserstofftechnologien*, Berlin, Springer Vieweg, 2022, ISBN 9783662645116.
DOI: 10.1007/978-3-662-64939-8_9

[66] F. Foroughi, C. I. Bernäcker, L. Röntzsch, B. G. Pollet, *Understanding the Effects of Ultrasound (408 kHz) on the Hydrogen Evolution Reaction (HER) and the Oxygen Evolution Reaction (OER) on Raney-Ni in Alkaline Media*, Ultrasonics Sonochemistry, vol. 84, pp. 105979 (2022).
DOI: 10.1016/j.ultsonch.2022.105979

[65] C. I. Bernäcker, S. Loos, T. Rauscher, T. Weißgärber, B. Kieback, L. Röntzsch, *Pulvermetallurgie zur Herstellung von Elektroden für Power-to-X-Anwendungen*, pp. 147–157 in C. Broeckmann, H. Danninger, T. Weißgärber (Eds.): *Pulvermetallurgie – Nachhaltige Lösungen und neue Märkte*, Proceedings of the 39th Hagener Symposium, Heimdall-Verlag, Witten, 2021, ISBN 9783946537700.

[64] M. Vogt, F. Heubner, T. Weißgärber, L. Röntzsch, *Nachhaltige Wasserstoff-on-demand-Lösung — Gesteuerte Hydrolysereaktion zur ubiquitären Wasserstoffversorgung*, HZwei (ISSN: 1862-393X), vol. 20 (4), pp. 28–30 (2020).

[63] R. Baumann, T. Rauscher, C. I. Bernäcker, C. Zwahr, T. Weißgärber, L. Röntzsch, A. F. Lasagni, *Laser Structuring of Open Cell Metal Foams for Micro Scale Surface Enlargement*, Journal of Laser Micro/Nanoengineering, vol. 15, pp. 132–138 (2020).
DOI: 10.2961/jlmn.2020.02.2010

[62] F. Heubner, T. Weißgärber, L. Röntzsch, *Solid Hydrogen Carriers als H_2-Speicher*, HZwei (ISSN: 1862-393X), vol. 20 (2), pp. 26–29 (2020).

[61] H. A. Miller, K. Bouzek, J. Hnát, S. Loos, C. I. Bernäcker, T. Weißgärber, L. Röntzsch, J. Meier-Haack, *Green hydrogen from anion exchange membrane water electrolysis: A review of recent developments in critical materials and operating conditions*, Sustainable Energy & Fuels, vol. 4, pp. 2114–2133 (2020).
DOI: 10.1039/C9SE01240K

[60] L. Röntzsch, F. Heubner, S. Mauermann, T. Weißgärber, B. Kieback, *Fortschrittliche Metallhydrid-Werkstoffe für die Wasserstofftechnologie*, pp. 245–262 in H. Danninger, L. Sigl, M. Schneider (Eds.): *Pulvermetallurgie – Schlüsseltechnologie für innovative Systemlösungen*, Proceedings of the 38th Hagener Symposium, Heimdall-Verlag, Witten, 2019, ISBN 9783946537656.

[59] T. Rauscher, C. I. Bernäcker, S. Loos, M. Vogt, B. Kieback, L. Röntzsch, *Spark-Plasma-Sintered Porous Electrodes for Efficient Oxygen Evolution in Alkaline Water Electrolysis*, Electrochimica Acta, vol. 317, pp. 128–138 (2019).
DOI: 10.1016/j.electacta.2019.05.102

[58] M. Ďurovič, J. Hnát, C. I. Müller, T. Rauscher, L. Röntzsch, M. Paidar, K. Bouzek, *Nanocrystalline $Fe_{60}Co_{20}Si_{10}B_{10}$ as a cathode catalyst for alkaline water electrolysis: Impact of a surface activation*, Electrochimica Acta, vol. 306, pp. 688–697 (2019).
DOI: 10.1016/j.electacta.2019.03.107

[57] C. I. Bernäcker, T. Rauscher, T. Büttner, B. Kieback, L. Röntzsch, *A powder metallurgy route to produce Raney-Ni electrodes for alkaline water electrolysis*, Journal of The Electrochemical Society, vol. 166, pp. F357–F363 (2019).
DOI: 10.1149/2.0851904jes

[56] T. Rauscher, C. I. Bernäcker, U. Mühle, B. Kieback, L. Röntzsch, *The effect of Fe as constituent in Ni-base alloys on the oxygen evolution reaction in alkaline solutions at high current densities*, International Journal of Hydrogen Energy, vol. 44, pp. 6392–6402 (2019).
DOI: 10.1016/j.ijhydene.2019.01.182

[55] F. Heubner, A. Hilger, N. Kardjilov, I. Manke, B. Kieback, Ł. Gondek, J. Banhart, L. Röntzsch, *In operando stress measurement and neutron imaging of metal hydride composites for solid-state hydrogen storage*, Journal of Power Sources, vol. 397, pp. 262–270 (2018).
DOI: 10.1016/j.jpowsour.2018.06.093

[54] A. Gabler, C. I. Müller, T. Rauscher, T. Gimpel, R. Hahn, M. Köhring, B. Kieback, L. Röntzsch, W. Schade, *Ultrashort-pulse laser structured titanium surfaces with sputter-coated platinum catalyst as hydrogen evolution electrodes for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 43, pp. 7216–7226 (2018).
DOI: 10.1016/j.ijhydene.2018.02.130

[53] T. Rauscher, C. I. Müller, A. Gabler, T. Gimpel, M. Köhring, B. Kieback, W. Schade, L. Röntzsch, *Femtosecond-laser structuring of Ni electrodes for highly active hydrogen evolution*, Electrochimica Acta, vol. 247, pp. 1130–1139 (2017).
DOI: 10.1016/j.electacta.2017.07.074

[52] A. Gabler, C. I. Müller, T. Rauscher, M. Köhring, B. Kieback, L. Röntzsch, W. Schade, *Ultrashort pulse laser-structured nickel surfaces as hydrogen evolution electrodes for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 42, pp. 10826–10833 (2017).
DOI: 10.1016/j.ijhydene.2018.02.130

[51] F. Heubner, S. Mauermann, B. Kieback, L. Röntzsch, *Stress development of metal hydride composites for high density hydrogen storage applications*, Journal of Alloys and Compounds, vol. 705, pp. 176–182 (2017).
DOI: 10.1016/j.jallcom.2017.02.113

[50] M. Tegel, S. Schöne, B. Kieback, L. Röntzsch, *An efficient hydrolysis of MgH_2-based materials*, International Journal of Hydrogen Energy, vol. 42, pp. 2167–2176 (2017).
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[49] I. Bürger, M. Dieterich, C. Pohlmann, L. Röntzsch, M. Linder, *Standardized hydrogen storage module with high utilization factor based on metal hydride-graphite composites*, Journal of Power Sources, vol. 342, pp. 970–979 (2017).
DOI: 10.1016/j.jpowsour.2016.12.108

[48] C. Cremers, L. Röntzsch, *Brennstoffzellen als Range-Extender*, pp. 85–89, in R. Neugebauer (Ed.): *Ressourceneffizienz*, Springer Vieweg, Berlin, 2017, ISBN 9783662528884.
DOI: 10.1007/978-3-662-52889-1

[47] A. Goldberg, C. Pohlmann, L. Röntzsch, C. Freitag, A. T. Tagne Saha, S. Ziesche, U. Partsch, *Highly efficient and long-term stable micro fuel cell system based on ceramic multilayer technology*, 6th Electronic System-Integration Technology Conference (ESTC), Grenoble, France, pp. 1–6 (2016).
DOI: 10.1109/estc.2016.7764494

[46] M. Tegel, L. Röntzsch, *PowerPaste für mobile und autarke Brennstoffzellen*, HZwei (ISSN: 1862-393X), vol. 16 (4), pp. 35–37 (2016).

[45] T. Rauscher, C. I. Müller, A. Schmidt, B. Kieback, L. Röntzsch, *Ni-Mo-B alloys as cathode material for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 41, pp. 2165–2176 (2016).
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[44] C. I. Müller, K. Sellschopp, M. Tegel, T. Rauscher, B. Kieback, L. Röntzsch, *The activity of amorphous iron-based alloys as electrode materials for the hydrogen evolution reaction*, Journal of Power Sources, vol. 304, pp. 196–206 (2016).
DOI: 10.1016/j.jpowsour.2015.11.008

[43] M. Dieterich, C. Pohlmann, I. Bürger, M. Linder, L. Röntzsch, *Long-term cycle stability of metal hydride-graphite composites*, International Journal of Hydrogen Energy, vol. 46, pp. 16375–16392 (2015).
DOI: 10.1016/j.ijhydene.2015.09.013

[42] F. Heubner, C. Pohlmann, S. Mauermann, B. Kieback, L. Röntzsch, *Mechanical stresses originating from metal hydride composites during cyclic hydrogenation*, International Journal of Hydrogen Energy, vol. 40, pp. 10123–10130 (2015).
DOI: 10.1016/j.ijhydene.2015.06.053

[41] K. Herbrig, C. Pohlmann, Ł. Gondek, H. Figiel, N. Kardjilov, A. Hilger, I. Manke, J. Banhart, B. Kieback, L. Röntzsch, *Investigations of the structural stability of metal hydride composites by in-situ neutron imaging*, Journal of Power Sources, vol. 293, pp. 109–118 (2015).
DOI: 10.1016/j.jpowsour.2015.05.039

[40] C. Pohlmann, K. Herbrig, Ł. Gondek, N. Kardjilov, A. Hilger, H. Figiel, J. Banhart, B. Kieback, I. Manke, L. Röntzsch, *In operando visualization of hydride-graphite composites during cyclic hydrogenation by high-resolution neutron imaging*, Journal of Power Sources, vol. 277, pp. 360–369 (2015).
DOI: 10.1016/j.jpowsour.2014.12.011

[39] J. Fu, M. Tegel, B. Kieback, L. Röntzsch, *Dehydrogenation properties of doped $LiAlH_4$ compacts for hydrogen generator applications*, International Journal of Hydrogen Energy, vol. 39, pp. 16362–16371 (2014).
DOI: 10.1016/j.ijhydene.2014.08.023

[38] J. Gluch, S. Niese, L. Röntzsch, E. Zschech, *X-ray microscopy and tomography of hydrogen storage materials*, Microscopy and Microanalysis, vol. 20, suppl. 3, pp. 1568–1569 (2014).
DOI: 10.1017/s143192761400957x

[37] C. I. Müller, T. Rauscher, A. Schmidt, T. Schubert, T. Weißgärber, B. Kieback, L. Röntzsch, *Electrochemical investigations on amorphous Fe-base alloys for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 39, pp. 8926–8937 (2014).
DOI: 10.1016/j.ijhydene.2014.03.151

[36] C. Pohlmann, B. Kieback, L. Röntzsch, *Composite materials of melt-spun $Mg_{90}Ni_{10}$ and graphite: Microstructural changes during cyclic hydrogenation and the impact on gas and heat transport characteristics*, International Journal of Hydrogen Energy, vol. 39, pp. 8331–8339 (2014).
DOI: 10.1016/j.ijhydene.2014.03.163

[35] J. Gluch, S. Niese, C. Jung, L. Röntzsch, E. Zschech, B. Kieback, *Electron and X-ray tomography of iron/iron oxide redox reactions for large-scale hydrogen storage*, Microscopy and Microanalysis, vol. 19, suppl. 2, pp. 578–579 (2013).
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[34] K. Herbrig, L. Röntzsch, C. Pohlmann, T. Weißgärber, B. Kieback, *Hydrogen storage systems based on hydride-graphite composites: Computer simulation and experimental validation*, International Journal of Hydrogen Energy, vol. 38, pp. 7026–7036 (2013).
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[33] C. Pohlmann, T. Hutsch, L. Röntzsch, T. Weißgärber, B. Kieback, *Novel approach for thermal diffusivity measurements in inert atmosphere using the flash-method*, Journal of Thermal Analysis and Calorimetry, vol. 114, pp. 629–634 (2013).
DOI: 10.1007/s10973-013-3048-9

[32] C. Pohlmann, L. Röntzsch, F. Heubner, T. Weißgärber, B. Kieback, *Solid-state hydrogen storage in Hydralloy-graphite composites*, Journal of Power Sources, vol. 231, pp. 97–105 (2013).
DOI: 10.1016/j.jpowsour.2012.12.044

[31] C. Pohlmann, L. Röntzsch, T. Weißgärber, B. Kieback, *Heat and gas transport properties in pelletized hydride–graphite composites for hydrogen storage applications*, International Journal of Hydrogen Energy, vol. 38, pp. 1685–1691 (2013).
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[30] A. Schmidt, T. Schubert, L. Röntzsch, T. Weißgärber, B. Kieback, *Rapidly solidified Fe-base alloys as electrode materials for water electrolysis*, International Journal of Materials Research, vol. 103, pp. 1155–1158 (2012).
DOI: 10.3139/146.110804

[29] J. Fu, L. Röntzsch, T. Schmidt, M. Tegel, T. Weißgärber, B. Kieback, *Comparative study on the dehydrogenation properties of $TiCl_4$-doped $LiAlH_4$ using different doping techniques*, International Journal of Hydrogen Energy, vol. 37, pp. 13387–13392, (2012).
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[28] M. E. Toimil-Molares, L. Röntzsch, W. Sigle, K. H. Heinig, C. Trautmann, R. Neumann, *Pipetting nanowires: In situ visualization of solid-state nanowire-to-nanoparticle transformation driven by surface diffusion-mediated capillarity*, Advanced Functional Materials, vol. 22, pp. 695–701 (2012).
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[27] J. Fu, L. Röntzsch, T. Schmidt, T. Weißgärber, B. Kieback, *Improved dehydrogenation properties of lithium alanate ($LiAlH_4$) doped by low energy grinding*, Journal of Alloys and Compounds, vol. 525, pp. 73–77 (2012).
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[26] E. D. Koultoukis, S. S. Makridis, L. Röntzsch, E. Pavlidou, A. Ioannidou, E. S. Kikkinides, A. K. Stubos, *Structural, microchemistry, and hydrogenation properties of $TiMn_{0.4}Fe_{0.2}V_{0.4}$, $TiMn_{0.1}Fe_{0.2}V_{0.7}$ and $Ti_{0.4}Zr_{0.6}Mn_{0.4}Fe_{0.2}V_{0.4}$ metal hydrides*, Journal of Nanoscience and Nanotechnology, vol. 12, pp. 4688–4696 (2012).
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[18] L. Röntzsch, T. Schmidt, S. Kalinichenka, B. Kieback, *Hydrogen storage in melt-spun nanocrystalline Mg-Ni-Y alloys*, pp. 159–163 in D. Stolten, T. Grube (Eds.): *18th World Hydrogen Energy Conference 2010 - WHEC 2010,* Parallel Sessions Book 4: Storage Systems / Policy Perspectives, Initiatives and Cooperations, Forschungszentrum Jülich, 2010, ISBN 9783893366545.

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DOI: 10.1016/j.jallcom.2010.02.162

[15] S. Kalinichenka, L. Röntzsch, C. Baehtz, B. Kieback, *Hydrogen desorption kinetics of melt-spun and hydrogenated $Mg_{90}Ni_{10}$ and $Mg_{80}Ni_{10}Y_{10}$ using in situ synchrotron, X-ray diffraction and thermogravimetry*, Journal of Alloys and Compounds, vol. 496, pp. 608–613 (2010).
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